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"USDA NRCS *Technology News*" is a monthly electronic information piece provided by Science and Technology. It is designed to deliver pertinent information to our customers about new technology, products, and services available from the Soil Survey and Resource Assessment and the Science and Technology deputy areas. **"USDA NRCS *Technology News*"** is in a format that is available to all NRCS field staff.

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MESSAGE FROM THE DEPUTY CHIEFS

Lawrence E. Clark and Maurice J. Mausbach

Farmers in prairie states are growing a new kind of crop these days. They are harvesting the wind, the natural force that created severe soil erosion problems in the past and led to the Dust Bowl of the 1930's and the creation of our Agency. We have traditionally worked with farmers and ranchers to manage the potentially destructive forces of wind on soil and water resources through wind erosion control practices. However, this much-maligned force has turned out to be a benefit to farmers trying to stay on their ancestral land in difficult economic times. According to the New York Times (1):

> "That blasted wind, it turns out, (is) worth something after all. In a boom that seemed unimaginable a few years ago, it has become the nation's fastest-growing source of electricity, with capacity expected to double in the next 13 months."

New technological developments have made the cost of wind-generated energy competitive with other sources of energy. In 1999, the use of wind for energy expanded by 39 percent worldwide. The Department of Energy projects that, by the end of this year, approximately 4,600 megawatts of wind power generation will be in place, enough to provide for 1.7 million households (2). Recent energy problems in California highlighted the need for additional sources of electrical power such as wind.

Windmills, or turbines, as they are called, are springing up on farms in Minnesota, California, Iowa, Texas, South Dakota, and North Dakota. Studies have indicated that South Dakota, North Dakota, and Texas have enough wind power to provide energy for the whole United States. Even states such as Pennsylvania, West Virginia, and New York, which are not known for wind velocity, have projects for harnessing its energy. Some farms serve as a site for one or two windmills; others have more than a dozen. In at least one location, farmers are paid $2,000 a year for each turbine.

There is, of course, a down side to this "wind boom." Environmentalists are concerned that the towering turbines may be harmful to migrating birds. One project in California was relocated when the Audubon Society protested that it might be detrimental to the California condor. A significant limitation is that there is currently no mechanism for storing power when the wind is not blowing, and backup systems must be retained to supplement wind power at times of low velocity. Another drawback is that the turbines are noisy, and therefore are likely to be opposed in urban and suburban areas.

It seems ironic that a force of nature that provided the impetus for the establishment of our Agency has come to the forefront again in a positive environment. When the dark clouds of the Dust Bowl led Congress to form the Soil Erosion Service, who would have guessed that in the future farmers would benefit from the wind, rather than be harmed by it? Long before the advent of modern windmills, NRCS played a significant role in returning the wind-damaged prairie to productive farms. When we look at the old photographs of blowing soil and barren fields, we can be proud of our heritage of technical assistance that has made this land productive again.

Now farmers and ranchers are benefiting further from harvesting the energy of wind using new technologies. They are paid, not only for traditional crops, but also for

electrical power generation. However, the same energy that is used for electric power generation is also at work on our soil and water resources. Therefore, NRCS wind erosion technologies are as relevant now as they ever have been. And, NRCS continues to work with the Agricultural Research Service to develop improved erosion prediction technologies. The Wind Erosion Prediction System (WEPS 1.0) was recently tested in several States and is scheduled to be implemented in field offices by the end of calendar year 2002 along with the Revised Universal Soil Equation, Version 2. When implemented, WEPS 1.0 will replace the existing Wind Erosion Equation and provide significant technical improvements for predicting soil erosion by the forces of wind.

Indeed, the farmers who provide a home to the new turbines are continuing to farm—at least partly because the new income enables them to remain in their family homesteads. These farmers may receive technical assistance from utility companies to manage their turbines, but they will still need technical assistance from NRCS, and new wind erosion control technologies, to assure that there are no more Dust Bowls

1 Jehl, Douglas, "Curse of the Wind Turns to Farmers' Blessing," New York Times, November 26, 2000
2 Ibid.

CONSERVATIONIST'S CORNER
Charles Whitmore, Midwest Regional Conservationist

The Midwest Region includes Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin. The region encompasses an area of roughly 293 million acres. The population is over 57 million, of which 72 percent is considered urban and 28 percent is rural. The Midwest Region is home to diverse landscape, natural resources, and human population.

The issues facing our region vary as much as the culture. The loss of cultivated cropland coming from urban development is just one of those issues. This change is occurring mostly around the major metropolitan areas of Detroit, Chicago, Milwaukee, St. Louis, and Minneapolis/St. Paul. Agricultural land converted to urban land equals more than 1.7 million acres. In addition, more than 430 thousand acres of cultivated cropland were shifted to pastureland.

NRCS employees continue to build their skills to reach out to new groups and individuals in both urban and rural settings and more effectively address the impact of land use conversion and other conservation issues on our customers, landscape, and wildlife. The Midwest Conservation Partnership has used the expertise of the NRCS Institutes as a resource on many occasions to address more effectively the conservation issues in the Midwest Region.

The Social Sciences Institute (SSI), for instance, has welcomed our ideas about and requests for information that assists the workforce in becoming more successful when working with new and former customers. A nine-module training session "Developing Your Skills to INVOLVE COMMUNITIES in Implementing Locally Led Conservation"

was developed by SSI in partnership with Michigan State University (MSU) and MSU Extension. Available for use nationally, we have received outstanding responses when the program was presented in the Midwest Region.

Our use of demographic data, researched and provided by SSI, was instrumental in locating minority and limited resource customers in the region. We are working with SSI to update the data with the recently available 2000 Census. Midwest states use this information to structure their outreach efforts to the audience, saving time and money when products are being developed.

The Soil Quality Institute (SQI) also has developed helpful educational materials on soil information. The Soil Primer is a tool that teachers are able to use in the classroom during the study of soil biology. The Primer is a great tool for the students participating in the national natural resource competition, The Envirothon. In addition, the SQI produces a yearly Soil Planning Guide. This guide, which contains many facts about soil and soil quality, is distributed to landowners to assist them in planning the yearlong agenda of natural resource related meetings and events.

The Wildlife Habitat Management Institute (WHMI) continues to provide Technical Notes to assist NRCS field staff with conservation efforts dealing with wildlife. The WHMI organized a regional workshop on riparian management for NRCS fish and wildlife biologists. The workshop provided valuable information for use in planning riparian management, and addressed current riparian issues and technology.

The Midwest Region has been very pleased with the work from the Institutes. Their technical assistance, training, and products are timely, and continue to be valuable resources for The Conservation Partnership in the Midwest.

NEW PRODUCTS AND SERVICES

Cumulative Effects Analysis Guide for NRCS Under Development

A guide intended for use by planners and specialists involved with clients, stakeholders, and partners who are developing areawide and watershed plans is now under development by the Watershed Science Institute.

"Evidence is increasing that the most devastating environmental effects may result not from the direct effects of a particular action, but from the combination of individually minor effects of multiple actions over time (1)." In general, modern natural resources conservation programs are positive in their effect at the site level. However, treatments may inadvertently have negative impacts when applied at the areawide level. For example, perfection and use of tillage techniques in an area to the exclusion of erosion-controlling herbaceous and woody buffers that are crucial for restoring habitat for indigenous wildlife.

The guide will review key considerations and requirements of Cumulative Effects Analysis under the National Environmental Policy Act (NEPA) of 1969, and explain and demonstrate the integration of cumulative effects analysis into the areawide conservation planning process used by NRCS.

1 Council on Environmental Quality, Considering Cumulative Effects, 1997

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New Soil Quality Test Kit Tools Developed

Two additional tools have been developed to enhance the value and usability of the Soil Quality Test Kit. First, the Soil Quality Test Kit Guide has been translated into Spanish. The Guide is an 82-page booklet containing procedures for 12 on-farm tests, guidance for interpreting results, data recording sheets, and instructions for building a test kit. The Soil Quality Test Kit is effective for creating an awareness of the importance of soil quality. It can be used to compare soils under different land management systems, track changes in soil quality over time, or demonstrate the effects of practices, such as conservation tillage, on soil quality.

The Institute of Soils, of the National Institute of Agricultural Technology of Argentina, translated the Soil Quality Test Kit Guide into Spanish. The Soil Quality Institute (SQI), with the help of Manuel Rosales, Colorado conservation agronomist, reviewed the Spanish translation.

In addition, the SQI has developed an Excel spreadsheet for Test Kit data. The spreadsheet, available in English only, will calculate test results and basic summary statistics when raw test data are entered.

The spreadsheet and the Spanish version of the Guide are available on the SQI web site at http://www.statlab.iastate.edu/survey/SQI/kit2.html

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Online Report of Farm Bill Impact on Wildlife Conservation

"A Comprehensive Review of Farm Bill Contributions to Wildlife Conservation, 1985-2000" is now available online from the Wildlife Habitat Management Institute (WHMI). Last year, the WHMI set out to produce a synthesis based on the scientific literature that would explain what Farm Bill programs have done for wildlife conservation. The project evolved into a collection of summaries, contributed by leading experts, that details wildlife responses to Farm Bill programs. This report includes annotated bibliographies for all published literature pertaining to the Conservation Reserve Program and Wetlands Reserve Program.

Wildlife are indicators of the health of the environment. As such, they are good measures of the success of our conservation programs. This report can contribute to a better understanding of the environmental benefits that have been gained through Farm Bill programs and of the opportunities for further improvements in these important and worthwhile programs.

The report can be viewed and downloaded from WHMI's web site at: www.ms.nrcs.usda.gov/whmi. Sharing the news of the document's release with other interested parties is encouraged.

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"Seeking Common Ground for Conservation" Report Available

"Seeking Common Ground for Conservation" is the title of the preliminary findings of a two-year study undertaken by the Soil and Water Conservation Society (SWCS) and supported by the W.K. Kellogg Foundation, The Farm Foundation, and NRCS. The purpose of the project is to assist stakeholders and policymakers shape the conservation provisions of the 2002 farm bill. The comments and recommendations of 75 state and local agricultural, wildlife habitat, water resource, and soil and water conservation leaders are included in the report. Support for enhanced technical support infrastructure is emphasized in the "Expanding the Reach of Existing Programs" section of the preliminary findings. The "capacity to deliver high quality technical advice consistently across all counties was raised as a serious limitation…." The report can be found on the SWCS web site at: www.swcs.org

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TECHNOLOGY RELATED TO KEY AGENCY DECISIONS

The Agency leadership has identified two key Agency decisions for emphasis in FY 2001. Conservation planning and nutrient management are at the top of the list of work for the Agency. Products and services that are most closely related to these two key Agency decisions will be identified in USDA NRCS Technology News from time to time in this section.

"Agricultural Waste Management Systems – Level 2" Training

"Agricultural Waste Management Systems – Level 2," a new training program, is now available. This training program is intended for field personnel who are, or will be, providing livestock and poultry producers with assistance in waste management.

This course is a self-paced, computer-based training (CBT) program packaged as a CD (compact disk) and a workbook. The CBT approach uses computer and multimedia technology to create a complete multisensory learning program by presenting the material in written word, narration, pictures, animation, and audio. The "Agricultural Waste Management Field Handbook" serves as the foundation and reference for the course.

The technology team for this project included staff from the National Water and Climate Center, National Water Management Center, Conservation Engineering Division, and the National Employee Development Center (NEDC).

For more information, go to the NEDC homepage at http://www.ftw.nrcs.usda.gov/nedc/homepage.html and click on "Agricultural Waste Management Systems – Level 2."

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Animal Waste Management Software Released

The new USDA NRCS Animal Waste Management (AWM) computer program has been approved for distribution, including for installation on CCE machines. AWM is a planning tool used to estimate the production of waste materials within an animal feeding operation and determine the size of storage/treatment facilities. The process and calculations used in AWM are based on the USDA NRCS Agricultural Waste Management Field Handbook. AWM will be useful to NRCS staff and others certified to design the waste storage/treatment components of a Comprehensive Nutrient Management Plan (CNMP).

AWM does not estimate the nutrient concentrations of waste products. Further development of AWM will continue, and feedback from users will be solicited in spring 2001 to help set priorities for program enhancements.

To download and install AWM go to:
http://www.wcc.nrcs.usda.gov/water/quality/common/wastemgmt/awm.html

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WEB BASED TECHNOLOGY

Conservation Planning Atlas Now Available

A web-based atlas to assist planners and stakeholders in defining area wide objectives is now available. This atlas was developed by the USDA National Agroforestry Center, a partnership between the NRCS and the Forest Service. The purpose of the atlas is to provide a general overview of national and regional issues and encourage a larger scale perspective in conservation planning efforts. The atlas can also provide guidance for prioritizing projects and creating policy change. A compilation of assessment and resource maps collected from a variety of governmental agencies and non-governmental organizations, it can be viewed quickly with an Internet browser.

The atlas is part of a larger project under development that will facilitate the design of conservation buffers for multiple objectives. The planning framework integrates regional landscape and site scale information using a question-based process. The atlas supports the regional component of the planning framework.

The atlas includes both national and Midwest regional maps. Midwest maps are included in the atlas to illustrate the use of regional information since the larger buffer project is being developed and tested in the Corn-belt Ecoregion. Each map includes a description

as well as references or Internet links for additional information. Presently, over a hundred maps are available, organized around the following headings: Clean Water, Water Use, Stable and Biodiversity, Aesthetics and Recreation, Ecosystem Health, Demographics, Climate Change, Air Quality, and Cultural Resources. The atlas is not all-inclusive and will be updated as new information and sources are identified.

Both Internet Explorer and Netscape can be used to view the atlas. However, Internet Explorer works best. Resetting monitor resolution to 1152 x 864 allows the maps to be viewed without having to scroll. The web address is:
http://www.unl.edu/nac/conservation/atlas/index.html

For more information, contact:

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Visit the Ecological Site Information System Web Site

The Ecological Site Information System (ESIS) web site is the repository for the data associated with the collection of forestland and rangeland plot data, and with the development of ecological site descriptions. ESIS is organized into two applications and associated databases: Ecological Site Descriptions (ESD) and Ecological Site Inventory (ESI).

The ESD application provides a structure for organized data input, revision, and retrieval of ecological site description information. As ecological site descriptions are developed, they will be entered into this database.

The ESI application provides the capability to enter, edit, and retrieve agroforestry, forestry, and range plot data. Plot data collected via the Soil-Woodland Correlation Field Data Sheet (ECS-005), the Windbreak-Soil-Species Evaluation Data Sheet (ECS-004), and the Production and Composition Record for Native Grazing Lands (SCS-RANGE-417) will be stored in this database.

The web site address for ESIS is: http://plants.usda.gov/esis

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Visitors to PLANTS Web Site Increase

The NRCS PLANTS web site <plants.usda.gov> continues to receive accelerated use by you, NRCS partners, and other customers. For the first quarter of this fiscal year, it received 6 million hits during 300,000 visitor sessions. The National Plant Data Center (NPDC), sponsor of the site, is working closely with our plant materials discipline and others to continue adding more information on high priority conservation plants.

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TRAINING

Hydric Soils Training Files Now on the Web

Several Microsoft PowerPoint presentations on hydric soils are now available at the NRCS Wetland Science Institute (WSI) web site. The materials cover hydric soil terminology, redoximorphic features, using soil taxonomy to assist in identifying hydric soils, and the NTCHS/NRCS field indicators of hydric soils.

The presentations are available for interactive viewing using Microsoft PowerPoint on the web site, downloading as PowerPoint presentations, or viewing using Adobe Reader. To view or download go to the WSI web site at http://www.pwrc.usgs.gov/WLI/ and look under the "Training Materials" menu.

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HONORS

PLANTS Recognized as a Distinguished Educational Resource

PLANTS has been recognized by MERLOT (Multimedia Educational Resource for Learning and Online Teaching) as "a distinguished, high-quality source of learning material." The MERLOT project <www.merlot.org> is an online community of faculty that collaborates to increase the quantity of high quality web-based, interactive teaching and learning materials. MERLOT's primary audience is teachers and learners anywhere who are interested in using technology in higher education.

Benefits to PLANTS include feedback from peers and students, professional recognition from discipline communities linked to professional organizations, and the MERLOT peer review process.

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